

# Granite Street

## Cambridge, MA

### Traffic Calming Project Evaluation

#### BACKGROUND

Granite Street is located in the Cambridgeport Neighborhood, and is bordered by the Morse Elementary School, a playground and a ball field on the south side and houses on the north (See Location Map). In 1998, the Morse School was closed for major renovation. In conjunction with the school renovation, the roadway and sidewalk on Granite Street was reconstructed.

In response to neighbors concerns about speeding on Granite Street and to improve the safety of neighborhood children going to and from school, the City worked with residents to design traffic calming into the roadway reconstruction. Construction was substantially completed in the fall of 1998.

#### PROJECT ELEMENTS

The traffic calming measures used on this project include:

**Curb Extensions** at the intersections of Granite Street and:

- ◆ Magazine Street (See Diagram 1) at the beginning of Granite Street.
- ◆ Pearl Street (See Diagram 2) at the main entrance to the school.
- ◆ Rockingham Street at the entrance to the park.

By tightening up intersections, curb extensions reduce the length of crosswalks, slow vehicles by requiring tighter turns, reduce the amount of pavement, increase the amount of sidewalk and change the emphasis of the intersection away from motorized vehicles. Curb extensions also prevent cars from parking illegally at corners, thus improving sight lines for drivers and pedestrians.

**A raised crosswalk** across Granite Street at Magazine Street (See Diagram 1). This improves pedestrian safety in a number of ways. It encourages the use of the crosswalk by providing a strong visual cue, does not require the pedestrian to step down to the level of the roadway and then back up on the other side, and it slows vehicles by acting as a speed hump<sup>1</sup>. It also sends a message to drivers entering the corridor from Magazine Street to be more aware of non-motorized users.

**A raised intersection** at the intersection of Granite and Pearl Streets (See Diagram 2) at the main entrance to the school. This improves pedestrian safety in the same ways as raised crosswalks. It encourages the use of the crosswalks by providing a strong visual cue, does not require the pedestrian to step down to the level of the roadway and then back up on the other

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<sup>1</sup> A speed hump is an improved version of the old speed bump, with a broader, flatter area to traverse.

side, and it slows vehicles by acting as a speed hump<sup>2</sup>. It also sends a message to drivers entering the corridor from Pearl Street to be more aware of non-motorized users.

**Truncated domes<sup>3</sup>** (See Diagram 3) were constructed at the edge of the raised crosswalk and raised intersection. The purpose of these devices is to alert visually impaired pedestrians that they are leaving the sidewalk area and entering the roadway.

**The use of zebra crosswalk markings** (See Diagram 4) throughout the project. Zebra crosswalk markings emphasize the pedestrian crossing to both drivers and pedestrians.

The Granite Street improvements were constructed as a comprehensive traffic calming plan. All of the various measures work together to change the nature of the roadway and to reduce the speeds of vehicles. Both of the raised devices (the raised crosswalk at Magazine Street and the raised intersection at Pearl Street) were combined with curb extensions. This means that in addition to crossing on a raised crosswalk, pedestrians also have the benefit of crossing a much narrower street. Using the devices together increases the effectiveness of each.

The raised crosswalk and the raised intersection were constructed with concrete pavers. The pavers replicate the look and feel of brick. The pavers were used instead of brick for their durability under traffic and slip resistant finish. The change in color and texture from the asphalt street enhances the overall effectiveness of the improvements. The dramatic pavement markings on the approach slopes (See Diagrams 1 and 2) provide a strong visual cue to the driver that the roadway is changing elevation. All of the pavement markings used inlay tape which is highly visible, reflective, slip resistant and long lasting.

### **Signal at the Intersection of Granite and Pearl Streets**

During the community design process, many residents of Granite Street expressed concern about the effects of the traffic signal at the intersection of Granite and Pearl Streets. Residents were concerned about the speed and inattention of drivers on both Granite and Pearl Streets trying to “catch” the green light. As drivers were approaching the intersection, their attention was focused on the signal and not on the surrounding environment and other users of the street.

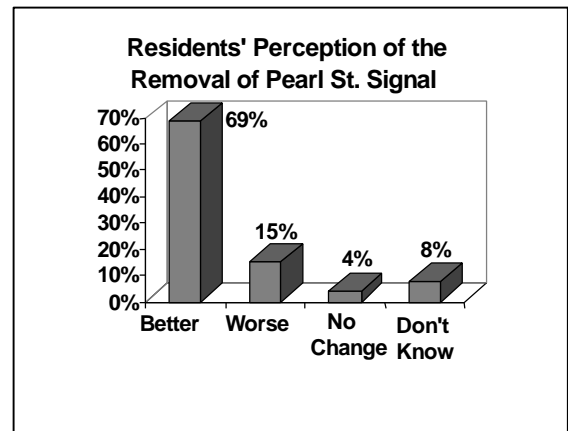
The signal was installed in 1961, several years after the opening of the Morse Elementary School. The signal was not installed to address a capacity issue. Based on national standards that the Commonwealth of Massachusetts and the City of Cambridge have adopted, the intersection does not have enough volume of vehicles or pedestrians to need a signal. Since the signal was installed, traffic calming devices (raised intersections, raised crosswalks, curb extensions, etc.) have been accepted as tools that better address pedestrian safety in locations like Granite Street.

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<sup>2</sup> See note 1.

<sup>3</sup> Truncated domes provide a small “bubble” like texture in the sidewalk material. They are used extensively at the edge of subway platforms.

The signal was removed as part of the traffic calming plan, after a thorough analysis and community discussion. Curb extensions and a raised intersection were constructed at the intersection and stop signs were installed on Granite Street and Pearl Street.



## EVALUATION

Ongoing evaluation of implemented projects is important to the continued success of the traffic calming program. Listed below are a variety of the possible tools that can be used. Each project is evaluated using the appropriate tool(s) for its circumstance.

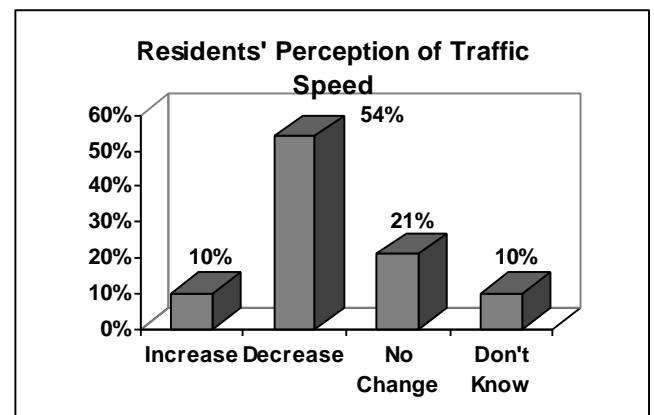
- **Speed Studies** – Both the percentage of vehicles exceeding the speed limit and the 85<sup>th</sup> percentile speed are used to evaluate changes in speeds. The 85<sup>th</sup> percentile speed is the speed under which 85 percent of vehicles travel. It is the industry standard for design purposes and speed studies.
- **Volume Counts** – How many vehicles, pedestrians and bicyclists use the street?
- **Maintenance Issues** – How well do different materials hold up over time, particularly under winter conditions? To what extent do various designs create new or exacerbate existing drainage and / or maintenance problems?
- **Pedestrian and Neighborhood Surveys** – How effective do the users and residents of the street perceive the improvements?

## Speed

As part of the ongoing evaluation of this project, before and after speed studies were conducted. Before the improvements the 85<sup>th</sup> percentile speed on Granite Street was 28 mph. After the improvements the 85<sup>th</sup> percentile speed was reduced to 24 mph.

The speed limit on Granite Street is 30 mph. Before the improvements were made 3% of vehicles were exceeding the 30 mph speed limit. After the improvements 1% of vehicles were exceeding the speed limit<sup>4</sup>.

On most residential streets in Cambridge, residents do not feel comfortable coexisting with traffic going 30 mph. 25 mph feels more comfortable and is safer for residents, pedestrians, motorists and cyclists.



Before the improvements were made 39% of vehicles were exceeding 25 mph. After the improvements 14% of vehicles were exceeding 25 mph.

<sup>4</sup> City of Cambridge, Traffic Parking and Transportation Department, Speed Studies, 10/20/98 and 1/5/99.

## Volume

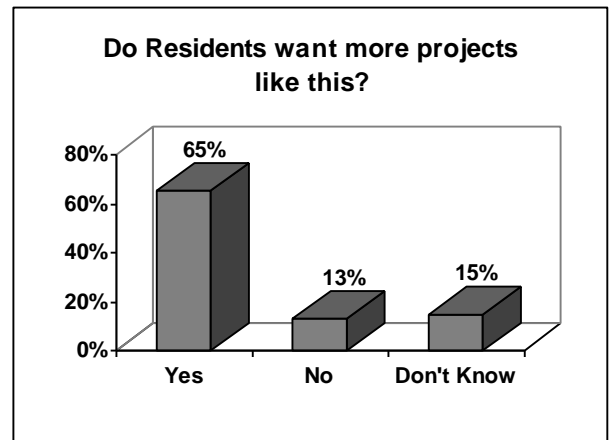
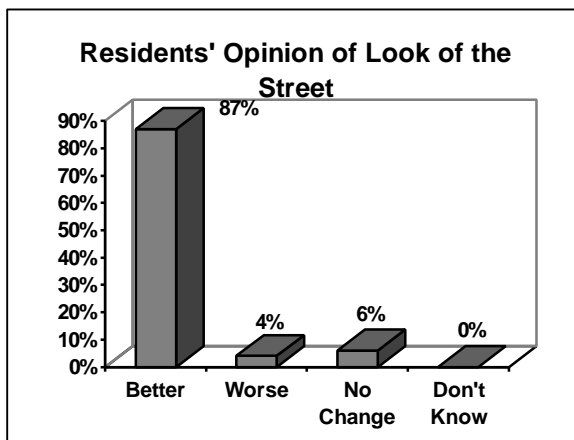
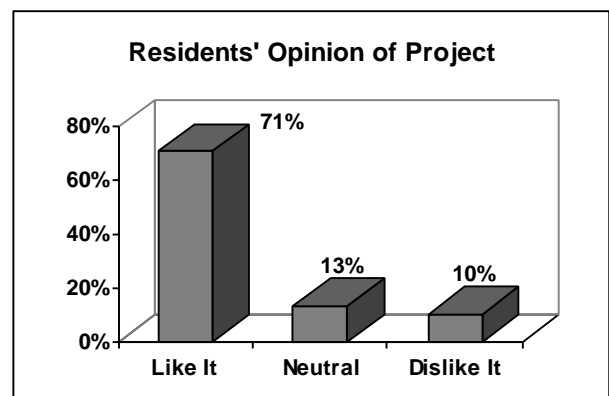
The goal of traffic calming is to make streets safer for people to bike, walk and drive. Traffic calming is not designed to shift traffic from one street onto another street. The City conducts volume counts to ensure that traffic is not inadvertently shifted. The traffic calming project has not diverted any traffic off of Granite Street. The number of vehicles on Granite Street, east of Pearl Street before the traffic calming changes was 4,470 vehicles per day. The number of vehicles at the same location after the project is 4,440 vehicles per day<sup>5</sup>.

## Maintenance

While there have not been any major maintenance problems, the City continues to monitor the improvements closely, particularly through the winter. Bollards were installed to help the snowplow operators locate the raised crosswalk and raised intersection. The effects of snow removal and other maintenance issues will continue to be evaluated.

## Survey

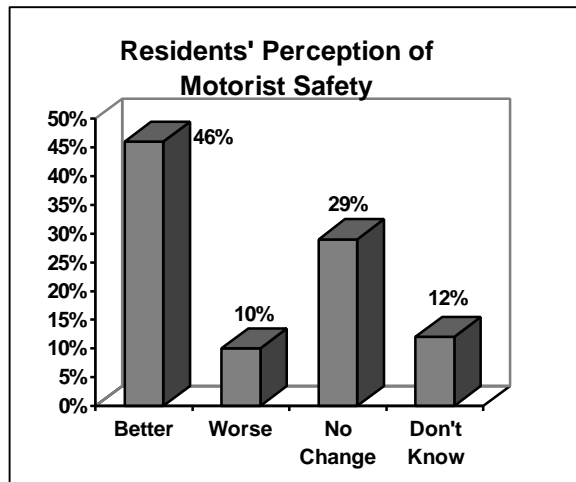
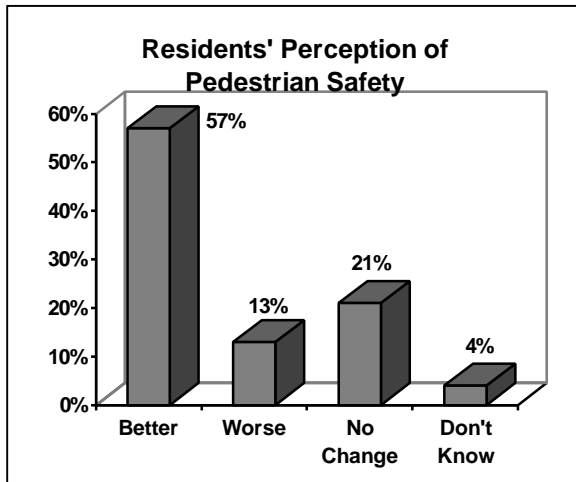
In April 1999, the City conducted a survey of residents to determine their perceptions about the recently completed traffic calming project. This was not a scientific survey since the returns were self-selected. 170 surveys, including a pre-stamped returned envelope, were delivered to residents along Granite Street and adjacent side streets. 52 surveys were returned for a 49% response rate. See attached survey and graphs.



<sup>5</sup> City of Cambridge, Traffic Parking and Transportation Department, Volume Counts, 5/29/96 and 5/5/99.

## Conclusion

The City and residents view this project as a success. The goals of reducing speeds and improving safety were met. The project is visually pleasing and is an enhancement to the community. Residents strongly support the traffic calming project and would like more projects like this in Cambridge.



# **Location Map**

## **Granite Street**

# Diagrams

## **Diagram 1**

**Curb Extensions and Raised Crosswalk  
Granite Street and Magazine Street**

## **Diagram 2**

**Curb Extensions and Raised Intersection  
Granite Street and Pearl Street**

# Diagrams

## **Diagram 3** **Truncated Domes**

## **Diagram 4** **Zebra Crosswalk Markings**



# Resident Survey for Granite Street Traffic Calming Project

In the fall of 1998, in conjunction with the Morse School reconstruction, the City reconstructed Granite Street and the adjacent sidewalks. As part of this project the City made a number of changes to Granite Street including: removing the **signal** at Pearl Street, and constructing **curb extensions** (at Magazine, Pearl and Rockingham streets), a **raised crosswalk** (at Magazine Street), a **raised intersection** (at Pearl Street), and **improved crosswalk markings**.

The construction project is mostly complete. Currently, around each of the raised devices there is an area in the sidewalk that is asphalt. In this area there are temporary black poles. These poles will be replaced with more substantial and more attractive permanent poles this summer. In addition, the asphalt will be replaced with a permanent surface.

We would like you to take a few minutes to fill out this survey, which will help us design future projects elsewhere in the city. If you have any questions, or if you know of anyone who should have received this survey but did not, please contact **Katherine Watkins at (617) 349-4655**.

Thank you for taking the time to give us your opinions and help us to evaluate this project.

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**Response Rate: 49% (52 of 107 returned)**

**1. How do you use the street? (Circle all that apply)**

drive 98% walk 96% bike 42% other 10%

**2. How do you think the project has affected the following traffic issues?**

- a) traffic speed                      54% decreased 10% increased 21% no change 10% don't know 6% no ans
- b) traffic volume                      8% decreased 4% increased 67% no change 15% don't know 6% no ans
- c) traffic noise level                      29% decreased 4% increased 40% no change 21% don't know 6% no ans

**3. How do you think the project has affected the following safety issues?**

- a) safety of pedestrians                      57% better 13% worse 21% no change 4% don't know 4% no ans
- b) safety of bicyclists                      33% better 8% worse 23% no change 31% don't know 6% no ans
- c) safety of motorists                      46% better 10% worse 29% no change 12% don't know 4% no ans
- d) safety of children playing 42% better 15% worse 15% no change 19% don't know 8% no ans

**4. How do you think the stop sign combined with the raised intersection at Granite and Pearl streets compares to the traffic signal that was removed?**

69% better                      15% worse                      4 % no change                      8% don't know                      4% no answer

**5. How do you think the street looks?**

87% better      4% worse      6% no change      0% don't know      4% no answer

6. **Do you think the City did a good job of involving the neighborhood in the planning stages of this project?**

54% yes      8% no      33% don't know      6% no answer

7. **What is your overall view of this project?**

71% like it      13% neutral      10% don't like it      0% don't know      6% no answer

8. **Would you like to see more projects like this around Cambridge?**

65% yes      13% no      15% don't know      6% no answer

9. **What street do you live on?**
- |           |            |                |            |
|-----------|------------|----------------|------------|
| Brookline | <u>6%</u>  | Pearl          | <u>31%</u> |
| Granite   | <u>21%</u> | Rockingham     | <u>23%</u> |
| Magazine  | <u>13%</u> | Rockingham Pl. | <u>6%</u>  |

**How long have you lived there?** 17.0 year average; 10.0 year median

10. **Do you rent or own your home? (Circle one)**      50% rent      48% own      2% no answer

11. **Do you own a car?** 6% no      92% yes      2% no answer      **If yes, how many?** 1.5 car average

12. **Do you have a driveway or other private parking space for your car(s)?**

60% yes      40% no

13. **How do you think the City handled the construction phase of this project? Please explain.**

1. Went well - 54%
2. Took too long - 10%
3. Parking bans kept getting extended - 4%

14. **What do you like best about the project? Why?**

1. Looks better - 35%
2. Removal of light at Pearl/Granite - 23%
3. Slower traffic - 13%

15. **What do you like least about the project? Why?**

1. Removal of light at Pearl/Granite (cars not stopping) - 13%
2. Need better signage/warning about tight turns - 13%
3. Nothing - 8%

Survey Mailed 4/7/99